

WHAT IS CLAIMED IS:

1       1. An audible alarm relay system comprising:  
2       a microphone for converting environmental sounds to electrical sound signals;  
3       processing circuitry for receiving the electrical sound signals, and analyzing the sound  
4       signals to determine if the sound signals contain a sound pattern that matches a stored sound  
5       pattern; and  
6       an output device for notifying a user that the digital sound signal contains a sound pattern  
7       that matches a stored sound pattern.

1       2. The audible alarm relay system of Claim 1, wherein the processing circuitry  
2       comprises:  
3       a processor for controlling the system;  
4       a time sampler for sampling the sound signals;  
5       a memory for storing the stored sound patterns;  
6       a band pass filter for determining if the sampled sound signals contain at least one  
7       frequency that matches a stored frequency; and  
8       a rate detector for determining if the sampled sound signals contain at least one rate that  
9       matches a stored rate.

1       3. The audible alarm relay system of Claim 2, wherein the output device notifies the  
2       user if the processing circuitry determines that the sampled sound signal contains both a  
3       frequency and a rate that matches a stored sound pattern.

1       4. The audible alarm relay system of Claim 3, wherein the output device is one of an  
2       audio, visual and tactile device.

1       5. The audible alarm relay system of Claim 1, wherein the audible alarm is any  
2       predetermined sound.

1       6.     The audible alarm relay system of Claim 1, further comprising noise cancellation  
2     means for monitoring the ambient noise and canceling the ambient noise from the environmental  
3     sounds.

1       7.     The audible alarm relay system of Claim 1, wherein the processing circuitry  
2     comprises:

3       a processor for controlling the system;  
4       a time sampler for sampling the sound signals;  
5       a correlator for correlating the sound signal with the stored sound pattern; and  
6       an analog memory for storing the stored sound patterns.

1       8.     The audible alarm relay system of Claim 7, wherein the time sampler performs  
2     the time sampling in one of the analog domain and digital domain.

1       9.     The audible alarm relay system of Claim 7, wherein the correlator performs the  
2     correlation in one of the analog domain and digital domain.

1       10.    The audible alarm system of Claim 1, wherein the system is an after-market add-  
2     on device for detecting pre-existing sound signals.

1       11.    The audible alarm system of Claim 1, further comprising:  
2       a transmitting unit, having the microphone and processing circuitry, for transmitting a  
3     wireless alarm command signal if a matching sound pattern is found; and  
4       a receiving unit having second processing circuitry and the output device for receiving  
5     the alarm command signal and notifying the user that the alarm command signal has been  
6     received.

1       12.    A method for relaying an audible alarm, comprising the steps of:  
2       storing a sound pattern of at least one audible alarm in a memory;  
3       monitoring the environment through a microphone;  
4       determining if a sound is detected in the environment;

5           analyzing the detected sound if a sound is detected;  
6           determining if a sound pattern of the detected sound matches a sound pattern stored in the  
7    memory; and  
8           outputting a secondary alarm if it is determined that a matching sound pattern is stored in  
9    the memory.

1           13.    The method for relaying an audible alarm of Claim 12, wherein the storing step  
2    comprises the steps of:

3            inputting the sound pattern of the at least one audible alarm through the microphone;  
4            analyzing the input sound pattern; and  
5            storing the sound pattern in memory.

1           14.    The method for relaying an audible alarm of Claim 13, wherein the analyzing step  
2    determines the frequency and rate of the sound pattern and stores the frequency and rate of the  
3    sound pattern in the memory.

1           15.    The method for relaying an audible alarm of Claim 12, further comprising the  
2    steps of monitoring the ambient noise and canceling the ambient noise from the environmental  
3    sounds.

1           16.    The method for relaying an audible alarm of Claim 12, wherein the analyzing step  
2    comprises the steps of:

3            time sampling the sound signals;  
4            correlating the sound signal with the stored sound pattern.

1           17.    The method for relaying an audible alarm of Claim 12, wherein the time sampling  
2    is performed in one of the analog domain and digital domain.

1           18.    The method for relaying an audible alarm of Claim 12, wherein the correlating is  
2    performed in one of the analog domain and digital domain.

1           19. The method for relaying an audible alarm of Claim 12, wherein the method is  
2 performed in an after-market add-on device for detecting pre-existing sound signals.

1           20. The method for relaying an audible alarm of Claim 12, further comprising the  
2 steps of:

3           transmitting from a wireless transmitter a wireless alarm command signal if a matching  
4 sound pattern is found; and,

5           receiving at a wireless receiver the alarm command signal and notifying the user that the  
6 alarm command signal has been received.

1           21. An audible alarm relay system comprising:  
2           a memory for storing the frequency and rate of at least one predetermined sound pattern;  
3           a microphone for converting environmental sounds to electrical sound signals;  
4           an analog to digital converter for converting the electrical sound signals to digital sound  
5 signals;  
6           a processor for determining if the digital sound signals contain at least one frequency that  
7 matches a stored frequency, and determining if the digital sound signals contain at least one rate  
8 that matches a stored rate; and  
9           an output device for notifying a user if the processing circuitry determines that the digital  
10 sound signal contains both a frequency and a rate that matches the frequency and rate of the at  
11 least one predetermined sound pattern.

1           22. The audible alarm relay system of Claim 21, wherein the output device is one of  
2 an audio, visual and tactile device.

1           23. The audible alarm relay system of Claim 21, wherein the audible alarm is any  
2 predetermined sound.

1           24. The audible alarm relay system of Claim 21, further comprising noise cancellation  
2 means for monitoring the ambient noise and canceling the ambient noise from the environmental  
3 sounds.

1        25. A method for relaying an audible alarm, comprising the steps of:  
2        inputting a sound pattern of at least one audible alarm through a microphone;  
3        analyzing the sound pattern of the at least one input audible alarm;  
4        storing the sound pattern in memory;  
5        monitoring the environment through the microphone;  
6        determining if a sound is detected in the environment;  
7        analyzing the detected sound if a sound is detected;  
8        determining if a sound pattern of the detected sound matches a sound pattern stored in the  
9        memory; and  
10        outputting a secondary alarm if it is determined that a matching sound pattern is stored in  
11        the memory.

1        26. The method for relaying an audible alarm of Claim 25, wherein the analyzing step  
2        determines the frequency and rate of the sound pattern and stores the frequency and rate of the  
3        sound pattern in the memory.

1        27. The method for relaying an audible alarm of Claim 25, further comprising the  
2        steps of monitoring the ambient noise and canceling the ambient noise from the environmental  
3        sounds.